REMARKS

The Examiner's recognition of Applicants' invention by the allowance of claims 23-34 and the indication of allowable subject matter in claims 12 and 15-22 is gratefully acknowledged.

Claim 1 has been amended more particularly point out that Applicants' ultra-accurate gas injection device includes an air flow device, and that the air flow device includes an air blower, an electronic throttle control valve and an airmeter, features originally recited in claims 6 and 8, now cancelled. Also, to enhance readability, the order of the recited elements has been revised. The dependency of claims 9 and 10 has been corrected to claim 1. Reference to a mass flow device in claim 16 is made consistent with the antecedent.

Claim Rejection based upon Murphy et al., alone or combined with Minowa et al.

Claims 1, 4, 7, 9-11, 13 and 14 were rejected under 35 U.S.C. § 102(b) as anticipated by United States Patent No. 6,235,254, issued to Murphy et al. in 2001. Claim 8, now cancelled, was rejected under 35 U.S.C. § 103 as unpatentable over Murphy et al. in view of United States Patent No. 6,6,401,694, issued to Minowa et al. in 2002. In view of the amendments to claim 1, it is appropriate to consider the rejections together.

Murphy et al. is directed to an apparatus for heating a catalytic converter. In discussing tests on the catalytic converter, the patent describes an experimental set-up for simulating vehicle exhaust gas, as shown in Fig. 2. Gas from hydrogen tank 346 and air tank 356 are injected into an air stream created by air blower 332, col. 10, lines 19, 31 and 38-39. In addition, liquid fuel is injected from syringe pump 362, col. 10, line 43. It is pointed out that the airflow of the system

in Fig. 3 determined by the speed of air blower 332. A second experimental setup 380 depicted in Fig. 4 uses air supplied from tank 356, instead of by a blower, and controls the flow of air by a manual valve (unnumbered). In contrast, Applicants' system comprises an electronic throttle control valve 58 in Fig. 5 to regulate air input to the blower, see page 19, beginning at line 6. The electronic throttle control valve provides a fast response time and improves accuracy of the injection device. Nothing in Murphy et al. contemplates an electronic throttle control valve to regulate the flow rate of the air stream. Thus, Murphy et al. does not teach or suggest Applicants' gas injection device.

Nor does Minowa et al. show this feature of Applicants' invention. Minowa et al. describes an engine that includes an electronic throttle control valve, a conventional usage for such devices. However, Minowa et al. relates to engine control. Nothing in the reference would suggest creating simulated exhaust gas using a mass flow device to inject a gas into an air stream, as in Applicants' invention. Furthermore, Applicants device involves an air stream created by a blower, and an electronic throttle control valve to regulate air input to an air blower, thereby providing more accurate control of the simulated exhaust gas. Minowa et al. does not show an air blower, and so cannot suggest controlling air to an air blower or use of an electronic throttle control valve to improve a simulated exhaust gas composition. Even if combined, there is nothing in the references to lead the practitioner to seek to control the air blower in Murphy et al., using an electronic throttle control valve, or to do so within a system that uses mass flow device to control injecting gas into an air stream. Thus, the references do not lead the practitioner to Applicants' invention.

Claim 1 is directed to Applicants' ultra-accurate gas injection device that includes, as key elements, an air flow device and a mass flow device. The air flow device includes an air blower

and an electronic throttle control valve for regulating air input to the air blower and thereby adjusting the air stream. Neither Murphy et al. nor Minowa et al. shows a blower with an electronic throttle control valve to control an air stream into which gas is injected. Therefore, even if combined, the references do not teach or even suggest Applicants' invention in claim 1.

Claims 4-7, 9-11, 13 and 14 are dependent upon claim 1 and not taught or suggested for the reasons set forth with regard to that claim. The claims recite additional features preferred in the practice of Applicants' invention, and not shown in Murphy et al. In particular, attention in directed to a recitation of gas in claim 4 that includes carbon monoxide, nitrogen oxides, carbon dioxide, nitrogen and hydrocarbons. In contrast, the gas injected by Murphy et al. in Fig. 2 is hydrogen and air. The rejection points to the list of fuels in Table 1. However, the fuel is injected as a liquid and is controlled by a syringe pump without need for a mass flow device. Thus, Murphy et al. does not disclose injecting the gases in claim 4 to simulate exhaust gas.

Therefore, it is respectfully requested that the rejection of the claims based upon Murphy et al., either alone or in combination with Minowa et al., be reconsidered and withdrawn, and that the claims be allowed.

Claim 2 Rejection under 35 USC § 103

Claim 2 was rejected under 35 U.S.C. § 103 as unpatentable over Murphy et al. in view of United States Patent No. 6,314,948, issued to Cathcart in 2001.

Claims 2 are dependent upon claim 1. For the reasons set forth above, claim 1 is not taught or suggested by the primary reference, Murphy et al.

Cathcart describes a dual fluid fuel injection system. The rejection points to Cathcart to show a pintle valve. However, it does not show a device that simulates exhaust gas by injecting gas into an air stream created by a blower that is regulated by an electronic throttle control valve. Thus, even when combined with Murphy et al., the references fail to show these significant features of claim 1, or dependent claim 2.

Therefore, it is respectfully requested that the rejection of the claims 2 be reconsidered and withdrawn, and that the claims be allowed.

Claim 3 Rejection under 35 USC § 103

Claim 3 was rejected under 35 U.S.C. § 103 as unpatentable over Murphy et al. in view of United States Patent No. 6,311,679, issued to Druzhinina et al. in 2001.

Claim 3 is dependent upon claim 1. As set forth above, Murphy et al. does not show the invention in claim 1. The rejection points to Druzhinina et al. to show an EGR valve for controlling an air charge to an engine. However, Druzhinina et al. does not show an EGR valve to control gas injection such as needed for simulating exhaust gas. Nor does Druzhinina et al. show an electronic throttle control valve to regulate air flow from a blower in simulating exhaust gas. Thus, the combination does not point the practitioner to Applicants' claim 1, or dependent claim 3.

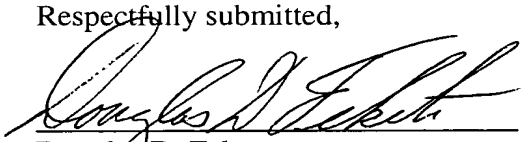
Therefore, it is respectfully requested that the rejection of the claims 3 be reconsidered and withdrawn, and that the claims be allowed.

Conclusion

It is believed, in view of the amendments and remarks herein, that all grounds of rejection of the claims have been addressed and overcome, and that all claims are in condition for allowance. If it would further prosecution of the application, the Examiner is urged to contact the undersigned at the phone number provided.

The Commissioner is hereby authorized to charge any fees associated with this communication to Deposit Account No. 50-0831.

Respectfully submitted,



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